

filling a first metal layer into entire first plurality of contact holes by one single step;

forming a conductive layer pattern on the first insulating layer spaced from said first metal layer;

F2 forming a second insulating layer on exposed portions of the conductive layer pattern, the first insulating layer, and the first plurality of contact holes;

forming second plurality of contact holes of substantially equal depth by removing portions of said second insulating layer to expose both the first metal layer and the conductive layer pattern, respectively; and

filling a second metal layer into said second plurality of contact holes to contact the first metal layer and the conductive layer pattern, respectively.

REMARKS

Claim 1 is amended, and new claim 9 is added. As a result, claims 1-2 and 7-9 are pending in the present application.

No new matter is introduced in the amended claim 1 and new claim 9. Support for the amendments in claim 1 can be found at least from page 5, last paragraph to page 6, first paragraph, and Figs. 2B, 2C, 2D. Support for claim 9 can be found at least in claim 1.

None of the cited references of record disclose or teach the amended claim 1. Therefore, Applicant respectfully submits that claim 1 and the dependent claims, claims 2 and 7-8, patentably distinguish over the cited references.

Referring to new claim 9, claim 9 claims filling one metal layer into an entire contact hole by one single step. On the contrary, Gutierrez discloses a two-step process for filling one metal layer into a contact hole, such as contact vias 226, 228. As shown in FIGs. 7 and 8, column 5, lines 18-24 ("All of the contact vias 218, 222, 224, **226, and 228** ... are formed by the above-described process."), and from column 3, line 61 to column 4, line 28, Gutierrez discloses that the first step is to deposit a tungsten by filling a tungsten fluoride gas which reacts with a silicon seed material (114, 116) to result in the deposition of tungsten in the contact vias 226 and 228. In column 4, lines 5-12, Gutierrez discloses that, "The reaction of tungsten fluoride with silicon will slow and eventually stop after the deposited tungsten is thick enough to prevent contact between the tungsten fluoride and the silicon... this reaction probably **will not deposit, by itself, sufficient tungsten to fill the recess...**" Accordingly, Gutierrez discloses the second step to fill the remaining portions of the recesses with conductive material by introducing hydrogen gas into the atmosphere of tungsten fluoride gas (see column 4, lines 21-28). Thus, Gutierrez teaches away from claim 9. Applicant respectfully submits that claim 9

08/327,887

PATENT


patentably distinguishes over Gutierrez. None of the other cited references of record disclose or teach claim 9.

In view of the above, Applicant respectfully submits that the present application is in a condition for allowance. Reconsideration of the present application and a favorable response are respectfully requested.

If a telephone conference would be helpful in resolving any remaining issues, please contact the below signed at 612-336-4733.

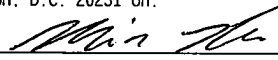
Respectfully submitted,

MERCHANT, GOULD, SMITH, EDELL,
WELTER & SCHMIDT, P.A.
3100 NORWEST CENTER
90 South Seventh Street
Minneapolis, Minnesota 55402
FAX 612/332-9081
PHONE 612/332-5300

By 
Min Xu
Registration No. 39,536
AX/maS

I hereby certify that this correspondence is being deposited with the United States Postal Service as first class mail in an envelope addressed to: Commissioner of Patents and Trademarks, Washington, D.C. 20231 on:

October 9, 1996
(Date of Deposit)


Min Xu